

ABSTRACT OF THE DISCLOSURE

5 The present invention provides a semiconductor device having a semiconductor multi-layer structure which includes at least an active layer having at least a quantum well, and the active layer further including at least a luminescent layer of $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$ ($0 < x < 1$, $0 \leq y \leq 0.2$), wherein a threshold mode gain of each of the at least quantum well is not more than 12 cm^{-1} , and wherein a standard deviation of a microscopic fluctuation in a
10 band gap energy of the at least luminescent layer is in the range of 75 meV to 200 meV.